ISSN 0228-4111

NEWSLETTER OF THE LONDON CHAPTER,
ONTARIO ARCHAEOLOGICAL SOCIETY
P.O. Box 2574, Station B, London, ON. N6A 4G9

February, 1992 92-2

"FILLING" IN THE PAST: RECENT PREHISTORIC FINDS IN WELLINGTON COUNTY

L.R. Bud Parker

This Month long-standing Chapter member Bud Parker will entertain us with a discussion of a project the consulting company he works with, Archaeological Research Associates, is currently involved with. A survey of possible landfill sites in Wellington County has led to the discovery of some important archaeological sites, including Hi-Lo occupations. Once again, the "archaeological desert" shrinks in size, in the face of archaeological investigations! Meeting night is Thursday, April 8th, at 8 PM, once again at the London Museum of Archaeology (formerly known as the Museum of Indian Archaeology). See you there!.

Next Month: Our May speaker night is cancelled due to the CAA conference.

LAST REMINDER:

THIS IS YOUR LAST CHANCE TO PAY YOUR 1992 CHAPTER MEMBERSHIP DUES BEFORE YOUR NAME IS REMOVED FROM OUR MAILING LIST!!!

ANNUAL RATES

Individual.....	$15.00
Family.....	$18.00
Institutional.....	$21.00
Subscriber.....	$17.00

Chapter Executive

EXECUTIVE REPORT

Member's may have been familiar with the debate at London's City Hall regarding possible uses for Grosvenor Lodge (aka. the Lawson Museum), located on Western Road near the University of Western Ontario. A number of proposals had been submitted to the city, including proposals to make the facility a Donnelly Family museum; use of the building as an AIDS hospice; or use of the facility as a centre for heritage and environmental groups in the city. To the surprise of many, City councillors voted recently to support the last proposal. This has direct implications for the London Chapter, since the Executive has been approached to see if it would like to be a member of this environmental-heritage coalition. As part of this group, the Chapter would be able to move into Grosvenor Lodge, solving the long term problem the Chapter has had in finding a place to call home. Discussions with the rest of the coalition are presently taking place, and Pat and Chris will be able to report in the next issue of **KEWA** what exactly is being proposed. Things look good, however, for the Chapter to have a new home. More importantly, as part of this coalition, the Chapter will have a much more prominent role as part of the heritage community in this city, thus increasing our profile, membership and range of activities...things are looking good!

At the February speaker night, Wayne Hagerty made a motion to have the Chapter donate $1,000 to the Main OAS endowment fund for **Ontario Archaeology**. The motion was passed unanimously, cheque sent, and a grateful OAS Provincial Executive thanked the Chapter for its contribution. The Chapter, along with a growing number of OAS members, have contributed to the fund, and the goal of achieving the $20,000 the OAS needs to match the Provincial contribution may be reached, ensuring the publication of **Ontario Archaeology** into perpetuity. Anyone interested in contributing to the fund should contact fundraiser Ron Williamson or OAS President Bruce Welsh at 416-531-6396, or the OAS Provincial office directly at 416-730-0797.

SOCIAL REPORT

As members know, the CAA conference this May 5th to 10th in London is shaping up to be a major event. The organizing committee has asked us to notify members that they will soon need to have a full list of volunteers who are willing to assist in the running of the conference. A first pre-conference "strategy" meeting will be held on Tuesday evening, April 14th, at 7:30 PM, at 55 Centre Street. Everyone willing to volunteer their time (in exchange for free registration, etc.) are asked to attend. For more information, call Neal at 433-8401, or 432-2165. Refreshments provided!

EDITOR'S NOTE

This month we feature reports from Mike Spence and Elizabeth Clark on osteological analyses of human remains from two localities in southwestern Ontario. Readers should also note that our well of possible **KEWA** articles is once again nearly dry. Don't be shy, please contribute! After all, don't you want to be considered when time comes 'round for us to pull together our next **BEST of KEWA** volume?! Also, you'll help us ensure that **KEWA**'s can go out on time. So, if you have a report or two collecting dust, but which you'd like to see published, by all means fire it off to us.

THE WARDSVILLE BURIAL

Elizabeth J. Clark and Michael W. Spence

Introduction

The Wardsville burial was a solitary burial found during alterations to the Wardsville golf course, just north of the clubhouse. It was in a grave 2-3 feet deep. No artifacts were found with the remains, although the conditions of discovery allow no definite statements about the nature of the grave or its associations. The fine preservation of the bone suggests a Late Woodland date. The bones were collected by Corporal W.H. Ornaka of the Ontario Provincial Police, Wardsville detachment. The remains are fairly complete and in a reasonably good state of preservation, though almost all are broken to some extent, a number represented only by fragments. A number of the bones show a greyish-brown staining over a portion of their external surfaces which may be due to ground water or the decay of associated grave goods or clothing (Figure 1). There is, in addition, one small spot of scorched bone that seems to indicate recent burning.

The recovered remains include the left temporal and partial occipital region of the skull, one mandibular molar, the hyoid bone, the right half of the manubrium, the left clavicle, both scapulae (in fragments), the left humerus, the proximal half of the right humerus, both ulnae, and both radii. There are six carpals and three metacarpals of the left hand and four carpals and four metacarpals of the right hand, along with three phalanges of the left hand. Twelve fragmentary ribs and a largely complete vertebral column represent the axial skeleton. Also present are the sacrum and the innominates, both femora, the left tibia, the fragmentary diaphysis of the right tibia, the fibulae (both lacking either end), and the right talus and calcaneus.

Missing bones include most of the skull and facial bones, the mandible, teeth, most of the sternum, the right clavicle, some of the hand bones, twelve ribs, nine thoracic vertebrae, most of the right tibia, most of the right foot bones, and all of the left foot bones. The breakage of the bones occurs mainly through the weaker, more delicate areas, though the diaphyses of several long bones have been broken through. This may be the result of earth pressures, though the marks of burning on the greater trochanter of the left femur do indicate some sort of recent disturbance. There is no evidence of postmortem dismemberment, nor of animal disturbance. The fact that many of the carpals and some of the smaller phalanges are present suggests a primary interment.

Sex

The mastoid process is only moderately large, while the posterior root of the zygomatic arch ends anterior to the auditory meatus, a feminine trait. The characteristics of the ilia must be depended upon for sex identification, since the pubic area has not survived.The bowl created by the ilia seems fairly round and spacious, while the sciatic notch is wide-angled and open in appearance. There is a definite pre-auricular sulcus evident, but there are no parturition scars. The sacrum also presents the feminine morphology of the slightly wider alae relative to the superior S 1 surface, There is no raising of the auricular area. The size of the humeral and femoral heads is small, while the bones overall present a gracile appearance, all indicative of a female.

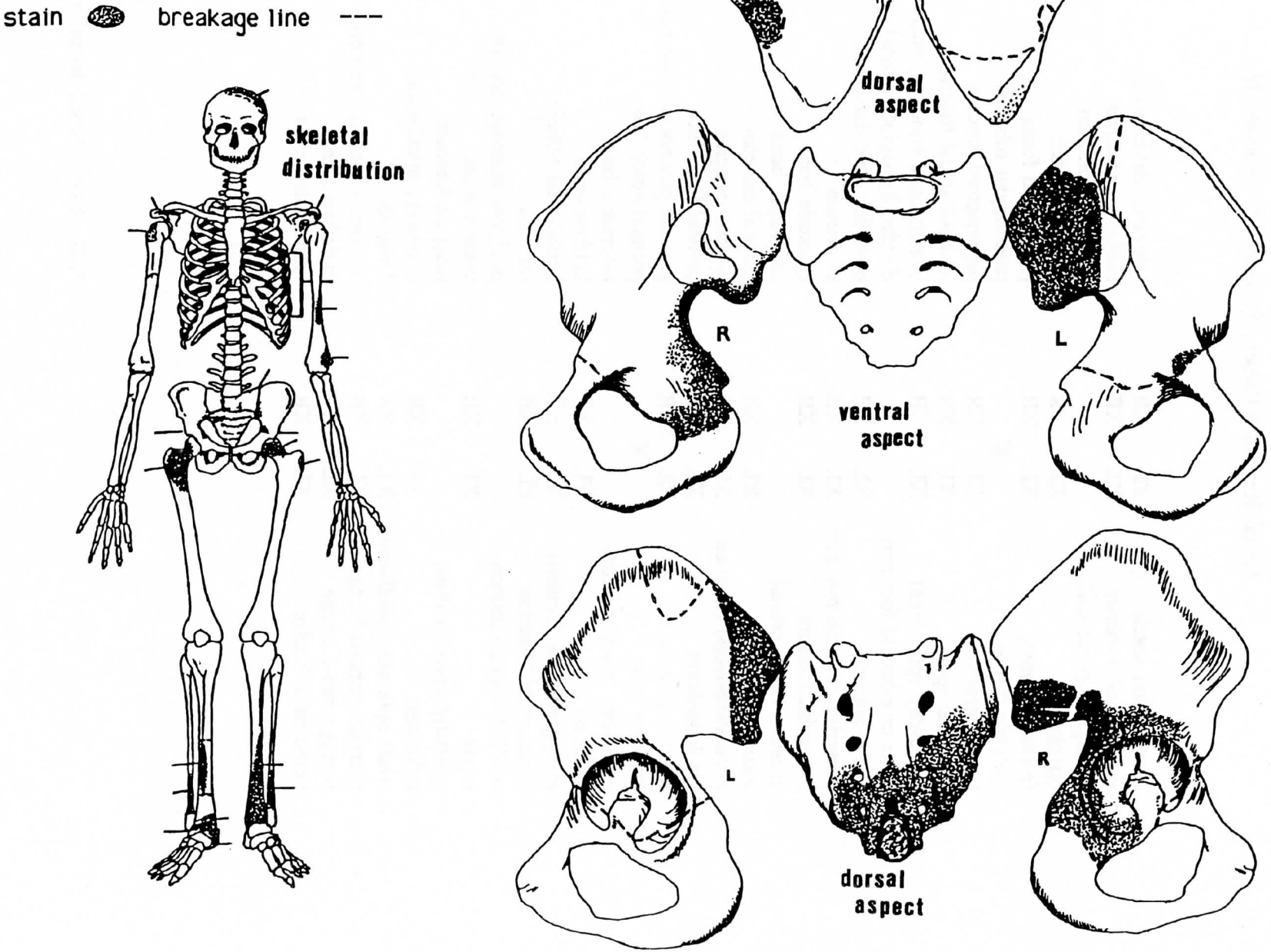

Figure 1: Wardsville Burial. Areas of staining and breakage lines.

TABLE 1:
CRANIAL AND MANDIBULAR DISCRETE TRAITS

L=left R=right A=absent P=present X=unobservable

Trait:				
supraorbital notch	XL	XR	tympanic dehiscence	AL XR
supraorbital foramen	XL	XR	auditory exostosis	AL XR
multiple supraorbital openings	XL	XR	marginal foramen	AL XR
frontal foramen	XL	XR	marginal notch	PL XR
metopic suture	X		pharyngeal fossa	X
frontal grooves	XL	XR	precondylar tubercle	XL XR
trochlear spur	XL	XR	paramastoid process	XL XR
accessory optic canal	XL	XR	ossified apical ligament	X
anterior ethmoid foramen above suture	XL	XR	intermediate condylar canal	AL XR
posterior ethmoid foramen	XL	XR	divided hypoglossal canal	AL XR
infraorbital suture	XL	XR	posterior condylar canal	AL XR
accessory infraorbital suture	XL	XR	H pterion	PL XR
zgomatico-facial foramen	XL	XR	epipteric bone	XL XR
Os Japonicum	XL	XR	bregmatic bone	X
maxillary torus	XL	XR	coronal ossicles	XL XR
palatine torus	X		sagittal ossicles	X
accessory lesser palatine foramen	XL	XR	parietal foramen	AL XR
pterygoid plate foramen	XL	XR	parietal process of temporal	AL XR
foramen of Vesalius	PL	XR	parietal notch bone	AL XR
medially open foramen ovale	XL	XR	asterionic bone	AL XR
medially open foramen spinosum	XL	XR	lambda bone	X
ovale-spinosum confluence	XL	XR	lambdoidal ossicles	XL XR
pterygo-spinous bridge	XL	XR	Os Inca	A
pterygo-basal bridge	XL	XR	occipito- mastoid ossicles	XL XR
spino-basal bridge	XL	XR	venous sinus	X
			mastoid foramen	PL* XR
			accessory mandibular foramen	XL XR
			accessory mental foramen	XL XR
			mylohyoid arch	XL XR
			mandibular torus	XL XR

*(2) - 1 on suture,1 lateral to suture

Age

The Wardsville individual seems to have been at least a fully mature adult at death. All epiphyses are fused, as expected in an adult of over 20 years of age. All sacral bodies have fused fully. The hyoid bone exhibits ossification of the body to the left greater cornu, but not to the right, which is missing, nor to the lesser cornua. The amount of osteoarthritic pathology is indicative of an older individual, and the vertebral bodies show a marked amount of porosity and marginal exostoses. The ectocranial vault sutures that can be examined are at some points obliterated.

The lack of a pubic symphysis made age determination dependent upon the auricular surface of the ilia, following Lovejoy et al (1985). The state of the auricular changes would seem to indicate an individual between 50 and 60 years of age. There are no transverse organization or striae evident. There is marked lipping of the inferior terminus of the demiface, especially on the left ilium, with a definite rim on the apex of the left but little apical change on the right. The superior demiface exhibits densification, while macroporosity is present on the inferior face. The general surface is fairly rugged, but not markedly. The retroarticular surface has some moderate osteophytic irregularity but is somewhat damaged, so that conclusions in that area are not definite. An age of 50 to 60 years seems most likely, especially when the extent of arthritic destruction to the joints and vertebrae is considered.

Cranial Morphology

With little remaining of the cranium but the left temporal bone and part of the occipital, not much can be said. The discrete traits are presented in Table 1, following Berry and Berry (1967), and Molto (1983). An H pterion is evident, as is a marginal notch on the auditory margin, and two mastoid foramina, one on the suture and one lateral to the suture. There are no accessory ossicles obvious in either the squamosal or left lambdoidal sutures.

Postcranial Morphology

Postcranial discontinuous traits are presented in Table 2, after Anderson (1963,1968) and Saunders (1978). The metric data are shown in Table 3, following Melbye (1971), Montagu (1960), and Brothwell (1981).

The vertebral column is represented by 15 of the 24 vertebrae, all of which are minimally damaged. They show no major anomalies like spina bifida or spondylolysis. Other minor discrete traits are not present, though in some cases the transverse processes are too damaged to assess. The sixth cervical exhibits a tiny notch on the posterior edge of the left foramen transversarium.

The scapulae are both marked by suprascapular notches, but no other traits. The olecranon fossa of the left humerus is obliterated with arthritic bone hypertrophy, making any observation of a septal aperture impossible, while postmortem damage to the lateral epicondyle is too great to assess the presence of a distal spur. The broken right humerus could not be examined for the pertinent traits. The right ulna displays a definite divided trochlear notch and a small distal tuberosity, though the left shows no divided notch and the distal third is missing.

The acetabula of both innominates possess good examples of an acetabular mark. Both left and right femora have third trochanters, and the right also has trochanteric fossa spicules and a Poirier's facet. The left femur is unassessable for a corresponding Poirier's facet due to a small amount of damage at the site. Some measurements could not be obtained because of arthritic hypertrophy on the margins of some of the joint surfaces.

Stature of the Wardsville female was ascertained using the femur, and the index for Mongoloid females, according to El-Najjar & McWilliams (1978).

$$2.59 \text{ (femur)} + 49.742 \pm 3.816$$
$$= 162.4 \text{ cm} \pm 3.816$$

The Wardsville female thus seems to have been between 158.6 and 166.2 cm in height (or between 5 feet, 3 inches and 5 feet, 6 inches).

The tibia bears mention for its rather platycnemic formation, with a platycnemic index of 61.3. Lovejoy et al (1975) suggest that the platycnemic tibia is better adapted to torsional stress, as well as antero-posterior bending. They go further to suggest that the platycnemic form may be more prevalent in hunting and gathering groups travelling over uneven, rough terrain. Unfortunately, in the Wardsville case we do not have the contextual data necessary to test this hypothesis.

Dentition

Only one mandibular molar from the right side was recovered. It has no caries or other obvious abnormalities, and did not possess any observable discrete traits. It did, however, have a moderate calculus buildup around the body that was concentrated on the mesial and distal surfaces, and extended onto the occlusal surface.

Racial and Ethnic Identity

It can only be surmised that the Wardsville female was a Native since no cranial or facial characteristics could be determined. It might be suggested that the platycnemic tibia may indicate a Native person, since Caucasians and modern groups are more likely to have a eurycnemic index (Lovejoy et al 1975).

Trauma and Pathology

Osteoarthritic pathologies

The Wardsville individual shows extensive arthritic damage to many of the joint surfaces that may be age- and/or activity-induced. Almost all of the recovered vertebrae exhibit some osteophytic involvement of the margins, and also a marked porous "erosion" of the vertebral bodies. No Schmorl's nodes were evident. The cervical vertebrae show no destruction of the atlas and a slight amount of damage on C2, but from C3 to C7 all show a moderate amount of lipping around the articular surfaces along with considerable porosity of the body surfaces. There is no observable consistency or patterning to this damage. The thoracic vertebrae are less affected,

TABLE 2:
POSTCRANIAL DISCRETE TRAITS

Atlas		
divided condylar facet	AL	AR
detroarticular foramen	AL	XR
spina bifida	A	
lateral bridge	AL	XR
posterior bridge	AL	XR
Axis		
spina bifida	A	
ossified apical ligament	A	
foramen transversarium		
open	AL	AR
Cervicals 3 -7		
spina bifida	3-A	4-A
	5-A	6-A
foramen transversarium		
divided	3-AL	AR
	4-AL	AR
	5-AL	AR
	6-PL*	AR
	7-AL	AR
Lumbars 1-S		
spondylolysis	AL	AR
mamilliary foramen	1 -XL	AR
	2-AL	AR
	3-AL	AR
	4-XL	AR
	5-AL	AR
Sacrum		
spina bifida of S1	A	
sacral hiatus	A	
accessory facet for ilium	AL	XR
Sternum		
sternal foramen	X	
Scapula		
unfused acromion epiphysis	AL	AR
suprascapular notch	PL	PR
humeral facet	XL	AR
glenoid fossa extension	AL	AR
Clavicle		
rhomboid fossa	AL	--
supra-clavicular foramen	AL	
sub -clavian facet	AL	

Humerus		
septal aperture	XL	--
supratrochlear spur	AL	
distal spur	XL	
pectoralis/teres major		
impressions	PL	
Ulna		
divided trochlear notch	AL	PR
distal tuberosity	XL	PR
Innominate		
accessory facet on ilium	XL	AR
sacro-iliac fusion	AL	AR
acetabular mark	PL	PR
Femur		
third trochanter	PL	PR
trochanteric fossa spicules	AL	PR
hypotrochanteric fossa	AL	AR
medial gastrocnemius fossa	AL	AR
Poirier 's facet	XL	PR
Patella		
vastus facet	--	
Tibia		
distal anterior squatting		
facet	XL	AR
distal lateral squatting facet	XL	AR
Calcaneus		
separate anterior &		
middle facets	--	AR
bipartite anterior facet		AR
Talus		
Os trigonum	--	AR
discrete neck facet		AR
lateral talar extension		XR

* tiny notch on posterior edge of left foramen

having only some anterior osteophytic lipping.

The lumbar vertebrae are considerably affected with lipping (L4 & L5-considerable; L1, L2, L3-moderate) and have the same extensive porous "erosion" of the body surfaces as is evident in the cervicals. The superior surface of L4 and the inferior surface of L3 show marked porosity concentrating on the left side of the body surfaces. There is no sign of compression in any of the lumbars. S1 also exhibits some porosity and a fair bit of lipping. This damage is most likely due to well-advanced osteoarthritis.

The articular head of the first rib is considerably damaged by arthritis, while the rest show only some lipping. The glenoid fossa of the left scapula shows a tiny amount of lipping on the margins of the articular surface, while the right shows moderate osteophytic development of the margin and a slight eburnation of the joint surface.The olecranon fossa of the left humerus is completely obliterated by arthritic hypertrophy within the fossa itself. There is extensive lipping around the lateral edge of the capitulum of this humerus and the medial margin of the trochlear surface, while the antero-medial trochlear surface itself exhibits an area of marked eburnation and porosity.

The left ulna shows a corresponding amount of arthritic damage, with hypertrophic lipping around the rim of the whole proximal joint surface, including the radial notch, accompanied by eburnation of the inferior face of the semilunar notch. The distal end is missing, so it cannot be compared to the right ulna. The right itself exhibits only a small amount of lipping around the semilunar and radial notches, minimal when compared to the left. The distal end of the right ulna shows osteophytic involvement of the antero-lateral articular margins and of the styloid process. This pattern of arthritis seems related to the antemortem break of the right radius and ulna that will be discussed later. The pattern of heavier arthritis on the left side may reflect a compensatory increase in workload there.

The left radius has a large amount of lipping around the proximal epiphysis and a sizeable amount of bone spurring around the distal joint surface articulating with the lunate. The right radius lacks the proximal end and one-quarter of the shaft, but the lower quarter exhibits a well-healed break. The distal anterior metaphysis has a large cloaca into the subchondral bone, while the whole of the distal articular surface is rimmed with osteophytes. The right navicular shows some arthritic damage, and the accompanying lunate has extensive arthritic lipping around the margins of the articulation with the radius and a cloaca on its superolateral aspect. However, the rest of the right hand carpals and the metacarpals show no arthritic damage at all. The left hand carpals, metacarpals, and phalanges similarly show no arthritic damage. Again, this destruction seems related to the healed break of the right ulna and radius.

The femoral heads are free of arthritic involvement, as are the distal articular condyles of the right femur. The left distal joint displays considerable buildup of hypertrophic bone on the articular margins of the medial condyle and an area of eburnation on the same condyle. The lateral condyle has only some lipping of the joint surface margins. The left tibia exhibits a correspondingly localized area of destruction, with extensive eburnation and erosion of the medial condyle and little damage to the lateral condyle. There is also a small nodule of hypertrophic bone rising from the anterior area of the superior articular surface on the medial condyle. Though

TABLE 3:
POSTCRANIAL MEASURES AND INDICES

Scapula	L	R
maximum length	X	
maximum breadth	X	X
glenoid fossa length	33	34
glenoid fossa breadth	24	26
Clavicle		
maximum length	--	
shaft diameter	--	
Humerus		
maximum length	299	X
physiological length	299	X
maximum shaft diameter	18	X
minimum shaft diameter	16	X
vertical diameter of head	39	39
transverse diameter of head	37	37
epicondylar breadth	X	X
lower articular surface breadth	X*	X
Radius		
maximum length	X	X
physiological length	X	X
maximum diameter of head	19	X
breadth of distal epiphysis	X	29
Ulna		
maximum length	X	262
physiological length	X	228
olecranon length	32	30
olecranon breadth	23	X
Femur		
maximum length	435	433
physiological (bicondylar) length	430	430
subtrochanteric antero-posterior diameter	20	20
subtrochanteric medio-lateral diameter	31	31
platymeric index	64.5	64.5
mid-shaft antero-posterior diameter	25	24
mid-shaft medio-lateral diameter	23	22
pilastric index	92.0	91.6
vertical diameter of head	38	38
transverse diameter of head	38	38
bicondylar breadth	X*	65
Patella		
maximum length	--	--
maximum breadth	--	--
maximum thickness	--	--
Fibula		
maximum length	X	X
Tibia		
maximum length	X	--
condylar breadth	X*	--
antero-posterior nutrient foramen diameter	31	--
medio-lateral nutrient foramen diameter	19	--
platycnemic index	61.3	--
antero-posterior mid-shaft diameter	X	--
medio-lateral mid-shaft diameter	X	--

* arthritic lipping

the evidence is far from conclusive, this extensive yet localized destruction may be the result of ligament damage never fully repaired, but compensated for by a shifting of weight and stress to the medial surface of the knee. Though arthritic destruction of the medial condylar surface is quite common due to the natural mechanics of the weight-bearing process (El Molto, personal communication), it must be noted that the right femoral condyles show no arthritic damage, while the left shows extensive destruction.

Fractures

The right ulna and radius exhibit well-healed breaks in three places that may or may not be related. The above-mentioned arthritic damage of the upper limbs may be a direct result of the infection that seems to have accompanied the healing of the breaks and the compensatory employment of the left elbow.

The right ulna displays two breaks with only minimal callosity, the upper break extending diagonally through the midshaft of the diaphysis, with some anterior displacement of the shaft, while the second break occurs on the shaft 30 mm from the distal end, having healed with little anterior displacement and callosity. The right radius shows a break on the distal quarter of its shaft, about midway between the two ulnar breaks. This one seems also to have healed with a minimum of callus formation, and some displacement medially, resulting in a small bony spur projecting from the top of the displaced lower part of the shaft, at a slight angle to the upper shaft section. Extensive infection is correlated with the break to the radius, leaving a cloaca, 2 mm in diameter, into the subchondral bone of the anterior surface of the distal metaphysis of the radius and another of 1.5 mm into the right lunate, and osteophytic involvement of the articular margins of the proximal carpal bones.

This infection may be indicative of a compound fracture, especially if all three breaks occurred simultaneously as a result of severe accident or violence. Yet if this were the case it would be likely that the shafts of both bones would display some osteomyelitis or at least periostitis, with an overgrowth of callus formation. Instead, the Wardsville bone shafts are clean of signs of inflammation, the callosities smooth and well-resorbed with only a small amount of bone spurring.

The separate breaks may be the result of discrete instances of injury, with differing causal factors. A distal break of the radius may be the result of a forceful fall onto the outstretched hand, creating a Colles fracture. This rarely, however, affects the ulna in the same manner that the Wardsville individual shows. A Colles fracture of the ulna usually damages the styloid process (Janssens 1970). Yet a fall of sufficient force and awkwardness might produce a variation of the usual pattern. A fall would seem more probable if the more proximal break of the ulna represented a separate event. Knowles (1983) makes note of the fact that Colles fractures are frequently found in conjunction with broken legs, which he attributes to travel over rough ground in which the individual twists and breaks a leg, falling onto an outstretched hand. This has implications for the Wardsville female when the condition of the left knee is considered, with the possibility of acute ligament damage.

The more proximal break of the ulna and the radius fracture occur close to midshaft, and are moderately displaced, as mentioned. Such injury may be the result of a direct blow to the arm

at an acute or right angle. This is often termed a 'parry fracture". It most frequently occurs only in the ulna, generally the left ulna. In ancient Egyptian populations, 31 percent of all fractures occurred in the forearm, with the ulna more frequently broken, and the injury more frequently on the left side. This incidence of forearm injury is twice the frequency occurring in modern city populations (Ortner & Putschar 1985). It is suggested that injury ensues when the individual throws up an arm to ward off an intended assault with a weapon. Knowles (1983) points out that a ninth century Czechoslovakian burial ground in Mickulcice shows a high incidence of parry fractures among men, specifically among those from the poorest graves. Janssens (1970) observes that in a parry fracture the line of fracture is always diagonal across the diaphysis, and that this proves a direct blow to the bone. In the Wardsville individual, the proximal break to the ulna does indeed exhibit a diagonal line of fracture. Wells (1964) notes that many of the "parry" fractures observed in ancient Egyptian skeletal material occur in females, with implications of wife-beating and/or a generally low status of women (cf. Knowles 1983).

Generally, though, such an injury involves only the ulna and not the radius. This suggests that either the directed force was of an extreme nature or that another cause is to be suspected. From the observed state of repair and resorption in the Wardsville female, all three breaks to the right radius and ulna appear to have occurred at the same time, although X-ray analysis would be required to be sure. If this were the case, the injury may have resulted from extreme direct violence or through an awkward fall, perhaps from a height. Ortner and Putschar (1985) note that the shearing stress producing a Colles fracture rapidly changes to bending stress in some instances (ie. an awkward fall), while a parry fracture is produced through a bending stress. In sum, it is not clear whether the injury was the result of an accident or an assault, though the damage to the ulna makes the latter seem more likely.

The injured limb, however, shows indications of good healing, with minimal displacement of the shaft ends, little distortion of the bone lengths, and no signs of infection at the sites of the breaks themselves. Careful splinting of the limb must have taken place, perhaps with the help of someone skilled in such healing. The manipulation and splinting of injured limbs has been noted among Native populations (Ortner & Putschar 1985). Yet some infection seems to have resulted anyway, as observed in the cloacae in the distal end of the right radius and in the right lunate, and corresponding bacterially-induced osteoarthritic destruction to the radius and the proximal carpal bones. It is notable that there is no arthritic involvement of the distal carpal bones, or of the metacarpals or phalanges of either hand.

References

Anderson, J.E.
1963 The People of Fairty. **National Museum of Canada Bulletin:** 193: 28-129.

1968 Skeletal "Anomalies" as Genetic Indicators. In: **The Skeletal Biology of Earlier Human Populations** (edited by D.Brothwell), pp.135-147. Pergamon Press. London.

Bass,W. M.
1987 **Human Osteology** (3rd edition). Missouri Archaeological Society Special Publication No. 2.

Berry, A.C. & R.J. Berry
1967 Epigenetic Variation in the Human Cranium. **Journal of Anatomy** 101:361-379.

Brothwell, D.R.
1981 **Digging Up Bones** (3rd edition). Cornell University Press. Ithaca.

El-Najjar, M.Y. & K.R. McWilliams
1978 **Forensic Anthropology**. Charles C. Thomas. Springfield.

Janssens, P.A.
1970 **Paleopathology**. John Baker. London.

Knowles, A.K.
1983 Acute Traumatic Lesions. In: **Disease in Ancient Man** (edited by G.D.Hart), pp.61-83. Clarke, Irwin. Toronto.

Lovejoy, C.O., A.H. Burstein, & K.G. Heiple
1975 The Biomechanical Analysis of Bone Strength: A Method and its Application to Platycnemia. **American Journal of Physical Anthropology** 44:489-506.

Lovejoy, C.O., R.S. Meindl, T.R. Pryzbeck, & R.P. Mensforth
1985 Chronological Metamorphosis of the Auricular Surface of the Ilium: A New Method for the Determination of Adult Skeletal Age at Death. **American Journal of Physical Anthropology** 68: 15-28.

Melbye, F.J.
1971 University of Toronto Physical Anthropology Laboratory IBM codification forms.

Molto, J.E.
1983 **Biological Relationships of Southern Ontario Woodland Peoples: The Evidence of Discontinuous Cranial Morphology**. National Museum of Man, Archaeological Survey of Canada, Mercury Series Number: 117.

Montagu, M.F.A.
1960 **A Handbook of Anthropometry**. Charles C. Thomas. Springfield.

Saunders, S.R.
1978 **The Development and Distribution of Discontinuous Morphological Variation of the Human Infracranial Skeleton.** National Museum of Man, Archaeological Survey of Canada, Mercury Series Number: 81.

Ortner,D.J. & W.G.J.Putschar
1985 **Identification of pathological Conditions in Human Skeletal Remains.** Smithsonian Contributions to Anthropology, Number 28. Smithsonian Institution Press. Washington.

Wells,C.
1964 **Bones, Bodies and Disease.** Frederick A. Praeger. New York.

THE STAG ISLAND BURIAL

Michael W. Spence

Introduction

A burial pit discovered by Ms. Holly Cusack on Stag Island in the St. Clair River, was examined with William A. Fox on July 2, 1981. By agreement with First Nations representatives, those bones which had fallen out of position were studied and then re-buried on the site. Although no diagnostic cultural materials were recovered, the burial practices suggest that the site is of the Springwells phase (ca. 1200-1400 AD) of the Western Basin tradition (Murphy and Ferris 1990: Table 7.1).

The burial pit had been exposed by erosion, part of it slumping down a bank that runs north-south along the burial's eastern side. For the purpose of analysis 3 concentrations of bone were identified in the exposed face and adjacent slumped sections. Concentration #1 was the southernmost cluster. A number of the bones had shifted ex-situ when the bank slumped at this point, but others remain in their original position, visible in the newly exposed face of the bank. The slump was a minor one, the bones moving only about a foot from their original locations, so some conclusions can still be made about the nature of the interment. Concentration #1 is composed entirely of the bones of one adult female. Visible in the bank wall are parts of a cranium and, immediately to the north, two broken long bones. The long bones are side by side and could not be identified with confidence, but are probably a tibia and fibula.

Concentration #2 included an *in situ* adult cranium lying face down, the top of the cranium oriented to the east. It rested on a number of ribs which may have been articulated (though no vertebrae were seen). At its upper north side was a radius. This cluster of bone was well separated from concentration #1. Concentration #3 is represented by several bones lying *in situ* immediately to the north, and a bit east, of #2. It is William Fox's judgement that they are probably of the same individual as #2, and that concentrations #3 and 2 are really a single bone cluster.

The Skeletal Material

The concentration #1 bones that had been moved out of position by the slump are a frontal piece, a couple of smaller fragments from the cranial cap, a tooth, both femora, both tibiae[1], the right fibula, part of the right side of the pelvis (the acetabulum and part of the ischium), both humeri, the right ulna, the left radius, and one rib fragment. A piece of scapula found at the foot of the bank is certainly of this individual too. The right tibia and fibula were side by side, in proper articular position, despite the slumping. Also, the left radius and humerus were nearly in the proper articular position, and other paired bones were not far from each other (the right ulna and humerus, the right femur and acetabulum). This suggests that some elements of the body had been articulated at the time of burial. However, it is doubtful that the body was fully articulated.

---

[1] Incomplete - either tibia could match the bone still *in situ* in the bank.

If it had been, only a tightly flexed position would have produced the close proximities of head, leg, and arm elements that were still apparent despite the slumping. However, if the burial had been tightly flexed there should have been more ribs, certainly some hand and foot bones, and perhaps some vertebrae, in the slumped area. The absence of these elements suggests a partially articulated and incomplete secondary burial.

The individual represented in concentration #1 was an adult female. The epiphyses of all the long bones were fully fused, suggesting an age of 20 or more years. The relatively small size of the long bones, the absence of supraorbital ridges, and the sharpness of the superior orbital margins indicate a female. The frontal fragment has a single supraorbital foramen on the left and a single notch (although largely bridged, so nearly a foramen) on the right. There are no supratrochlear or frontal foramina or notches. There is a frontal groove on the left, but no observation for this trait was possible on the right side. The supraorbital ridges are imperceptible. The single tooth recovered (*ex situ*, in the slumped area) is a premolar, but destruction of a good part of the crown by a large interproximal caries makes it impossible to identify the tooth more precisely. The wear pattern shows a marked mesio-distal inclination, but the significance of this is not clear since I cannot determine whether the tooth is an upper or lower, first or second, or left or right premolar.

Neither humerus has a septal aperture. None of the recovered bones show post-mortem alterations like those observed at the Younge site (Greenman 1937), nor were any pathological conditions observed. The only possible grave good recovered was a mass of grey-green unfired clay several centimetres thick in association with the frontal fragment. This association may have occurred accidentally with the collapse of the bank, but the minor extent of the displacement caused by the slumping suggests that the clay was originally in the immediate area of the facial skeleton. The mass was too thick to be a mask, and no attempt to shape it could be observed. Fitting (1965:75, Tables 39-40) notes the packing of clay into the faces of crania at the Riviere au Vase site, a Western Basin occupation ear Lake St. Clair, and relates these burials to the Younge and Springwells phases.

The cranium of concentration #2 is that of an adult female. Its condition (the maxilla and malars had become detached) and the necessity of immediate reburial limited the number of observations that could be made. Metric and non-metric data are presented in Tables 1-2. The discrete trait observations follow Berry and Berry (1967) and Anderson (1964, 1968). The intermediate condylar canal is formed by a small bridge of bone extending laterally from the side of the occipital condyle to the adjoining occipital surface (personal commlunication, J. E. Molto). Although very small inclusions are present in both the lambdoidal and coronal sutures, none are large enough to be counted as Wormian bones. An auditory exostosis is present on the left side but not on the right. There are no pterygo-spinous or pterygo-basal bridges, nor are these represented even in trace form by spurs on the pterygoid plates or the sphenoid. There are not even trace appearances of the Os Inca or infraorbital suture. The left side shows a single mastoid foramen on the suture, with no accessories either medial or lateral to it. On the right, however, there is one foramen on the suture and a smaller one lateral to the suture, on the right temporal bone (there are none located medial to the suture). In the frontal bone on the right side there is a supraorbital notch for the passage of the supraorbital vessels, a smaller medial supratrochlear notch, and a small foramen located laterally (the frontal foramen of Berry and Berry 1967:369,

TABLE 1: STAG ISLAND CRANIUM, METRIC DATA

cranial length	177 mm	palatal breadth	40.0 mm
cranial breadth	138 mm	cranial index	77.9 mm
basion-bregma height	129 mm	cranial module	148.0 mm
basi-nasal length	102 mm	height-length index	72.8 mm
minimum frontal breadth	95 mm	height-breadth index	93.4 mm
palatal length	47 mm	palatal index	85.1 mm

TABLE 2: STAG ISLAND CRANIUM, DISCRETE TRAITS

L = left R = right A = absent P = present X = no observation possible

supraorbital notch -	IL	IR
supraorbital foramen -	OL	OR
supratrochlear notch -	OL	IR
supratrochlear foramen -	IL	OR
frontal foramen -	OL	IR
trochlear spur in orbital cavity -	AL	AR
metopic suture -	A	
zygomatico-facial foramen -	IL	XR
infraorbital suture -	AL	XR
Os Japonicum -	AL	XR
transverse palatine suture -	*	
palatine torus -	A	
maxillary torus -	AL	AR
supernumerary teeth in maxilla -	A	
cogenitally absent teeth in maxilla -	A	
coronal Wormians - (except for very small inclusions)	AL	AR
bregmatic bone -	A	
sagittal Wormians -	A	
parietal foramen -	IL	IR
pterion form -	H	
(parietal-sphenoidal contact)	L and R	
epipteric bone -	AL	AR

separate parietal notch bone -	AL	AR
parietal notch -	PL	PR
auditory exostosis -	PL	AR
foramen of Huschke -	AL	AR
mastoid foramen -	1 on suture L, 1 on suture and 1 lateral R	
asterionic bone -	AL	AR
Os Inca -	A	
lambda bone -	A	
lambdoidal Wormians - (except for very small inclusions)	AL	AR
highest nuchal line -	AL	AR
posterior condylar canal -	PL	PR
intermediate condylar canal -	PL	AR
pharyngeal fossa -	A	
ossified apical ligament -	P	
open foramen spinosum -	AL	AR
spino-basal foramen -	AL	PR
pterygo-basal foramen -	AL	AR
pterygo-spinous foramen -	AL	AR

* posterior deviation at mid-line of palate

figs. 3,6). On the left there is a supraorbital notch, a small supratrochlear foramen medial to it, and no frontal foramen (other than a tiny opening too small to admit a probe). A small segment of ossified apical ligament is located on anterior margin of the foramen magnum.

The metric data in Table 1 offer a general picture of cranial form. Cranial deformation was not practiced. There is no saggittal keel or occipital mound, although there is a very small occipital torus formed by a slight ridge at the inion. The tympanic plates are not thickened. V-shaped median supraorbital ridges are present but not marked. The nasal sill is sharp. The left malar shows a marginal tubercle but no zygomaxillary or malar tuberosity. No trephination or plaque removal occurred.

The moderate size of the supraorbital ridges and the degree of occipital ruggedness could indicate either a male or female. Without a good comparative series from the same time period and area it is difficult to judge sex on such criteria. However, the sharp superior orbital margins (sharper than those of the individual of concentration #1), the small size of the mastoid processes, and the limited size and posterior extension of the roots of the zygomatic arches over the mastoids all indicate a female.

The coronal, sagittal and lambdoidal sutures are still clearly visible externally. The squamosal suture is also open. This suggests age somewhere in the large 25-40 years bracket. The maxillary third molars are fully erupted, and on the left side the third molar has been worn to the point where the dentine is fully revealed, Brothwell's stage 5+ of wear (1963: fig. 30). The right third molar has been worn almost to the same point, although a thin film of enamel still covers the crown. Both maxillary first molars retain extensive "islands" of enamel (Brothwell's stage 4+ or 5). The premolars, worn to reveal the dentine, show considerably more wear than the single premolar associated with concentration #1. Despite the wear, however, there is little dental pathology. What evidence is available, then, indicates a female between roughly 25 and 40 years of age.

The mandible was not recovered, so dental analysis is limited to the maxilla. All teeth had erupted and are, with the exception of the two medial incisors, still firmly fixed in the maxilla. Wear is fairly heavy, with the dentine revealed on most teeth and the crowns worn flat. The diagonally slanted wear observed on the concentration #1 premolar was not present in this individual. There are no caries or abscesses. Other than some slight recession in the area of the molars (both left and right) that revealed their roots to some degree (Brothwell 1963: fig.58A -"slight"), there is no evidence of periodontal disease. There are slight tartar accumulations on the lingual surfaces of all the molars. Attrition and the necessity of making the observations in the field presented analysis of several traits (Carabelli's cusp, cusp morphology, enamel extensions and pearls). There is no crowding, displacemement or impaction of the teeth, and none are peg-shaped.

The generally good dental health is at first glance contradicted by the premortem loss of the two medial incisors (Figure 1). Both had been lost some time before death, since the bone shows considerable resorption there, but the loss was apparently not due to infection. The remaining parts of the sockets show no pitting or abscess formation. The most plausible explanation is ablation, the intentional removal of the teeth by force for ritual, decorative or

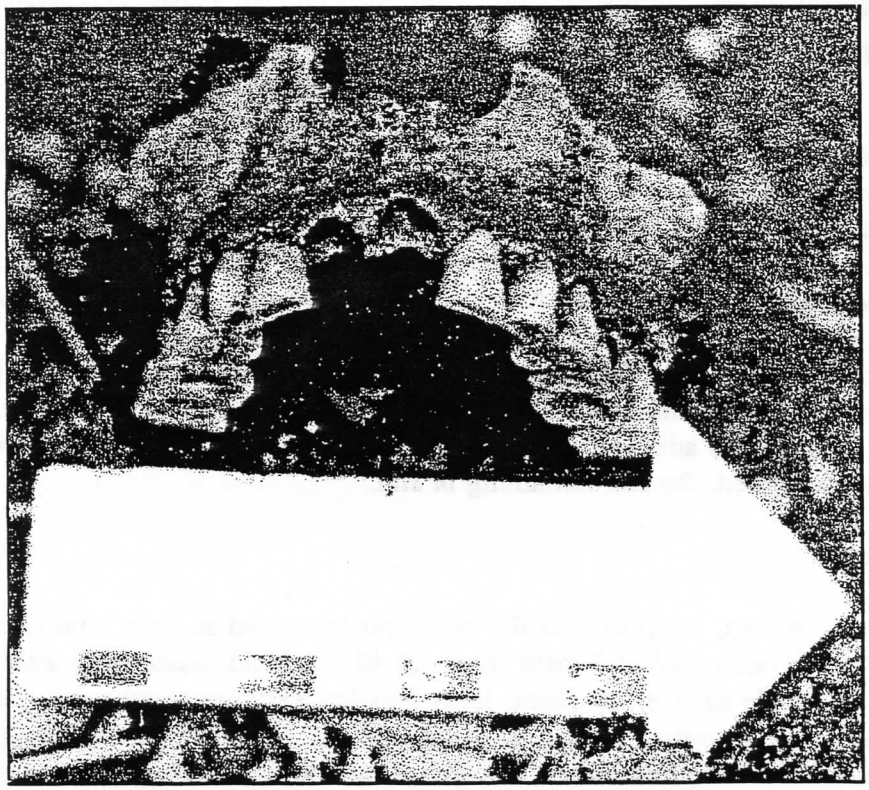

Figure 1: In the Field Photo of Maxilla Showing Evidence of Ablation.

social reasons. Hrdlička (1940) has suggested a number of criteria for the identification of ablation. The Stag Island burial satisfies all of the morphological conditions. Evidence of infection is absent, all the other teeth are in good condition and well anchored, and the loss is symmetrical. Furthermore, the remaining socket wall of one of the incisors shows considerably more resorption buccally than most of the rest of the perimeter, raising the possibility that the bone had been broken there, often the case in ablation (Hrdlička 1940:5). Hrdlička states that the best evidence for intentional ablation, as opposed to accidental trauma, would be the appearance of a number of cases in a population and the presence of distinct patterns of occurrence by sex or tooth (Hrdlička 1940:5-7). However, Merbs (1968) points out that accidental loss can also show varying sex patterns. He suggests that data on age and on the opposing teeth may help to distinguish deliberate from accidental removal. Unfortunately, with only one cranium and no mandible, no definite conclusions can be made in the Stag Island case. The absence of infection and the symmetry of the loss make ablation a distinct possibility, but a wider sample of crania must be examined. Also, Merbs (1968:28) believes that resorption is a rapid process, and that a socket may be filled within two months of the loss of the tooth. If this is so, the incomplete resorption of the Stag Island cranium alveolus may indicate that the incisors were lost only

shortly before death, in the full maturity of the individual[2]. Ablation generally takes place at a younger age. Still, it is quite possible that it was a special event, initiated by some circumstance that could occur later in life (e.g., as part of the mourning for a deceased spouse).

Concentration #3 includes the remains of 2 individuals, an adult female and an infant. The adult bones are probably of the same individual as the cranium of concentration #2, which is immediately adjacent to them. They include a fragment of sacrum, a right ulna and radius lying together in the proper articular relationship, 1 metacarpal, 1 trapezium, 1 thoracic vertebra, 1 foot phalanx and both left and right ilia. All epiphyses were fused, including the iliac crest, indicating a minimal age of 22 years. The size of the sciatic notch (but note the absence of a pre-auricular sulcus) shows that the bones are those of a female. Associated with the adult bones were 2 ribs and 1 humerus of an infant, probably about 6 months to one year in age to judge by the size of the bones. None of the adult or infant bones revealed pathologies. Only a part of concentration #3 could be examined, the rest remaining *in situ*.

Conclusions

The evidence, in sum, suggests that the burial pit contained at least 3 individuals: an infant of no more than a year, an adult female about 25-40 years old (associated with the infant), and a second adult female of over 20 years. Both females were apparently only partially articulated when buried. The scarcity of bone in the soil already fallen from the bank suggests that no further individuals were lost before our arrival, although it is very possible that more are yet uncovered in the uneroded part of the pit.

With such a small sample extensive comparisons with other sites would not be justified. If related material is recovered in the future and combined with this sample to produce a more adequate population, some concrete statements can then be made. At present, however, only a few brief comments are possible. The Stag Island adult burials are females, and the paucity of grave goods combined with multiple burial suggest a Late Woodland interment. The clay associated with the concentration #1 bone indicates ties to the Riviere au Vase and Younge sites. Comparison will thus be confined to Late Woodland females in the general region. These include one from the Wolf site, ca. 900-1550 AD on the northwest edge of Lake St. Clair (Benton 1939); some 6 to 13 (depending on the measurement) females from the Younge site, a 600-1400 AD settlement further to the northwest in Michigan (Hughes 1937); 2 to 5 females from the Gard Island #2 site, ca. 600-1200 AD on Lake Erie in southeastern Michigan (Lozanoff and Stothers 1975; Stothers, Lozanoff and Baden 1978); and 2 to 3 females from the Krieger site, ca. 600-1400 AD near Chatham in southwestern Ontario (Kidd 1956). All of these sites are part of the Western Basin tradition. The Gard Island #2 and Younge site populations show close biological relationships to one another (Stothers, Lozanoff and Baden 1978). Recent summaries of the archaeology of the region can be found in Fitting (1975), Fitting and Zurel (1976), Stothers and Pratt (1980), and Murphy and Ferris (1990).

---

[2] There has been no compensating mesial tilt of the 2 lateral incisors.

TABLE 3: METRIC COMPARISONS, LATE WOODLAND FEMALES

meas. (mm)	Stag Island	Wolf	Younge	Gard Is. #2	Krieger
cranial length	177	167	177	172	179
cranial breadth	138	130	134	133	121
basion-bregma ht.	129	129	129	135	139
basio-nasal length	102	96	99	NA	106
min. frontal breadth	95	83	92	NA	84
cranial index	77.9	77.8	75.8	76.9	67.8
cranial module	148.0	142.0	146.4	144.9	145.9
height-length index	72.8	77.2	74.4	76.7	77.4
height-brdth. index	93.4	99.2	95.5	92.9	114.7

The metric data (Table 3) suggest that the Krieger site females have least in common biologically with the Stag Island burial. The Younge and Gard Island #2 burials seem most closely related. Nothing can be said at present about discrete trait patterns. The best comparative data are from the Gard Island #2 site (Lozanoff and Stothers 1975; Stothers, Lozanoff and Baden 1978), but a larger Stag Island sample will be needed before relationships can be evaluated. It is regrettable that no analyses of the Riviere au Vase burials are available.

References

Anderson, James E.
1964 The People of Fairty. **National Museum of Canada Bulletin** 193: 28-129.

1968 **The Serpent Mounds Site Physical Anthropology**. Royal Ontario Museum Art and Archaeology Occasional Paper 11.

Benton, Robert
1939 Appendix A. The Human Remains. In Emerson F. Greenman, **The Wolf and Furton Sites, Macomb County, Michigan**, pp. 29-31. University of Michigan Museum of Anthropology Occasional Contribution 8.

Berry, A. C. and R. J. Berry
1967 Epigenetic Variation in the Human Cranium. **Journal of Anatomy** 101: 361-379.

Brothwell, Don R.
1963 **Digging up Bones**. The British Museum.

Fitting, James E.
1965 **Late Woodland Cultures of Southeastern Michigan.** University of Michigan Museum of Anthropology Anthropological Papers 24.

1975 **The Archaeology of Michigan.** Cranfield Institute of Science.

Fitting, James E. and Richard L. Zurel
1976 The Detroit and St. Clair River Area. In: **The Late Prehistory of the Lake Erie Drainage Basin** (edited by D. Brose), pp. 214-250. Cleveland Museum of Natural History.

Greenman, Emerson F.
1937 **The Younge Site: an Archaeological Record from Michigan.** University of Michigan Museum of Anthropology Occasional Contribution 6.

Hrdlička, Aleš
1940 **Ritual Ablation of Front Teeth in Siberia and America.** Smithsonian Miscellaneous Collections Vol. 99, no. 3.

Hughes, Byron O.
1937 Appendix B: Human Remains. In Emerson F. Greenman **The Younge Site: an Archaeological Record from Michigan.** pp. 125-172. University of Michigan Museum of Anthropology Occasional Contribution 6.

Kidd, Kenneth E.
1956 A Brief Study of the Human Remains from the Krieger Woodland Site in Southwestern Ontario. **Pennsylvania Archaeologist** 26: 15-26.

Lozanoff, Scott and David M. Stothers
1975 A Biocultural Analysis of an Early Late Woodland Population in Southeastern Michigan. **The Toledo Area Aboriginal Research Bulletin** 4(3): 1-51.

Merbs, Charles F.
1968 Anterior Tooth Loss in Arctic Populations. **Southwestern Journal of Anthropology** 24: 20-32.

Murphy, Carl and Neal Ferris
1990 The Late Woodland Western Basin Tradition of Southwestern Ontario. In: **The Archaeology of Southern Ontario to A.D. 1650** (edited by C. J. Ellis and N. Ferris), pp. 189-278. Occasional Publications of the London Chapter, OAS, Number 5.

Stothers, David M., Scott Lozanoff and William W. Baden
1978 Middle to Late Woodland Biological Continuity within the Western Basin Tradition. **The Toledo Area Aboriginal Research Bulletin** 7(1-2): 1-72.

Stothers, David M. and G. Michael Pratt
1980 Cultural Continuity and Change in the Region of the Western Lake Erie Basin: the Sandusky Tradition. **The Toledo Area Aboriginal Research Bulletin** 9: 1-38.